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YAMAOKA NOBUO(54) P-N JUNCTION TYPE LIGHT EMITTING
ELEMENT OF CUBIC BORON NITRIDE

(57) Abstract

PURPOSE: To obtain an element of this design which emits light rays that range from infrared rays to ultraviolet rays by a method wherein a fluorescent substance is annexed to a p-n junction or an (n) side surface of an element which is provided with a p-n junction and formed of a cubic boron nitride as a mother crystal.

CONSTITUTION: A high and low temperature section are provided in a vessel sealed under a high temperature and a high pressure condition, and cubic BN raw material particles and a p-type or an n-type doping material dissolved in a lithium nitride/calcium solvent is placed in the high temperature section. And, beryllium and silicon are employed as a p-type doping material and an n-type doping material respectively. Next, a cubic boron nitride crystal substrate of a conductivity type different from that of the above-mentioned doping material is put in the low temperature section, and cubic boron nitride crystal of conductivity type different from that of the crystal substrate is made to grow on the crystal substrate through separating taking advantage of the dissolution difference due to the temperature difference, whereby a p-n junction composed of an n-type layer 1 and a p-type layer 2 can be obtained. When a fluorescent substance is annexed to the surface of a p-n junction face 3, an element of this design can emit light rays which range from infrared rays to ultraviolet rays.

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